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AUTHOR Stevens, Ken; Bridgeman, Noel
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ABSTRACT

This paper describes two pilot programs that are developing networks among rural New Zealand schools to address the educational isolation of students. A program located in the South Island consists of a consortium of six small rural high schools using distance education technology to offer an expanded curriculum to rural students. The goal of the program is to overcome difficulties associated with small school size and reduce costs. The other program is located in the North Island and involves the linking of a large rural high school library software and CD-ROM facilities to 24 elementary schools. The high school also has access to the Internet via a link to a regional polytechnic center. Although these two networks are at an early stage of development, there are a number of emerging educational and policy issues that must be addressed: (1) rural schools' application of technology in extending curriculum at the secondary level and assessing learning outcomes; (2) learning needs of particular student groups; (3) participation of rural students in tertiary educational institutions and professional occupations as compared to their urban counterparts; (4) student and parent attitudes concerning the use of technology in reducing educational isolation; and (5) professional development needs of teachers. Contains 32 references. (LP)

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The Beginnings of Rural School Networking In New Zealand: Some Educational and Policy Issues

Ken Stevens
Department of Education
Victoria University of Wellington
PO Box 600
Wellington, 6015
New Zealand
Phone: +64-4-495-5174
Fax: +64-4-471-5349
E-mail: kensteve@matai.vuw.ac.nz

Noel Bridgeman
Department of Information Systems
Taranaki Polytechnic
Private Bag 2030
New Plymouth, 4620
New Zealand
Phone:+64-6-758-8059
Fax:+64-6-757-8261
E-mail:noelb@taranaki.ac.nz

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Abstract

New Zealand is one of the most isolated countries in the world with a rural population that is the basis of its economy. It is critical to the economic well-being of New Zealand to have a well-educated and technologically-literate population that includes those who live in the most remote parts of the country. One way of achieving this is through the networking of rural schools. Rural school networking is at an early stage of development in New Zealand at present and is being piloted in two locations: one in the North Island and the other in the South Island. One network is government-funded and links a large rural high school (grades 8-12) with several elementary schools (grades 1-7) and a regional polytechnic. The other is locally resourced and links six small rural high schools. A number of educational and policy issues are emerging at this early stage of the research: the professional development of teachers, the linking of rural schools with other communities, the choice of appropriate technology and the organisation of inter-school protocols. The use of Internet provides an opportunity for these two networks to link with international educational communities.

The Beginnings of Rural School Networking In New Zealand: Some Educational and Policy Issues

New Zealand is a geographically isolated country with a predominantly rural economy. Those who live and work in the more remote parts of this country face double isolation: isolation from the rest of the world and isolation from other New Zealanders. In response to the double isolation of rural New Zealand communities, links between new information and communication technologies and isolated schools are presently being developed, making rural education one of the fastest changing and most exciting areas of education in the country.

The Rural and Distance Education Relationship

Rural and distance education have usually been seen as the provision of schooling for people who live in geographically isolated areas. With recent developments in communication technologies however, distance education is perhaps now an inappropriate name; "tele-education" more accurately describes contemporary delivery of education at a distance (Buckrell et al, 1992; Stevens and Tate 1993c; Swift 1993; Telecom New Zealand, 1992; Tiffin et al 1992).

Distance education in New Zealand has always been paper-based, characterised by heavy dependence on postal deliveries of correspondence courses. Although many distance education courses are likely to continue along these lines, new electronic forms of delivery of education to students are currently being examined and evaluated by both educationalists and business people (Barker, 1988; D'Cruz,1990; Fasano et al, 1987;Parker et al, 1989;Telecom New Zealand, ibid). In the process, distance education is undergoing a transformation and, with this, the notion of isolation is being reconsidered (Rajasingham, 1992; Renwick 1993; Stevens 1993b). Changes in modes of delivery of distance education in New Zealand are likely, ultimately, to challenge the very notion of rural education (Stevens, 1992c).

New Communication Technologies and Rural Education

At the present time many new communication technologies are available in New Zealand; the problem for educators is knowing which ones are the most appropriate to use and in what combinations. To a considerable extent, distance education today is shaped by many combinations of technologies, put together in ways that were until recently not considered possible. In particular, the use of computers (with modems attached) enables senior high school

students and their teachers to communicate via electronic mail (E-mail) regardless of location or to access libraries and data stored in various locations.They can undertake research as effectively as their urban counterparts. The addition of modems to computers to access libraries and data stored in various locations enables senior rural high school students and their teachers to undertake research in major libraries as effectively as their urban counterparts. For some time now facsimile machines have been part of the administrative structure of schools and this development is a useful adjunct to the use of e-mail and the telephone. Perhaps more than most new technologies, it is the enhancement of the telephone that has facilitated new forms of communication.

The educational applications of television and radio are not new, but the development of storage facilities such as videos, tape recorders and even telephone answering machines as well as reproductive technologies such as paper copiers, mean that the rural student and teacher today is as well served as his or her urban counterparts. A particularly powerful new technology is the arrival of multi media compact discs which have the capacity to store a variety of forms of material: sound, visual and print, which the student can access in a variety of ways. Multi media interactive compact discs (CD-I) are, as the name suggests, small and capable of storing previously unheard of amounts of material. This technology has the potential to enhance the delivery of education at a distance.

There are four ways of linking schools and universities in New Zealand electronically: through tuia net, through audio-conferencing, through audio- graphics and through video-conferencing (Renwick, 1992; Stevens, 1993a). Audio-conferencing is perhaps the best known of these but video-conferencing is increasingly being used in tertiary educational institutions. Shortly, desktop video-conferencing combining personal computers and video technology are likely to be introduced, opening a new and personalised dimension to teaching at a distance.

Network One: The South Island

In Canterbury six small rural high schools have formed a consortium. The Canterbury Area Schools Association technology project (CASA tech) is one of the most ambitious and one of the most potentially useful developments in rural New Zealand education for many years.

The project aims to overcome the difficulties of school size and to reduce the costs of the provision of education in each of the communities that comprise it. School size has been of concern in recent years in developed countries (Bray, 1987; Macaskill, 1991). In some small New

Zealand rural communities there is a lack of specialist teachers and this type of consortium enables students in participating schools to access a larger range of professional expertise than would otherwise be available to them.

The retention of senior students in small rural schools has always been a difficult issue and it is hoped that the development of this consortium, will overcome some of these problems. In many rural communities there is a myth that urban schools are able to provide better education than rural ones. (Commission of Inquiry into Poverty, 1976; Schools Commission, 1975; Turney et al, 1980). Many rural families have accordingly, paid considerable amounts of money to enable their sons and daughters to attend urban boarding schools (Baker and Andrews, 1991; Boomer 1987; Henry 1989; McGaw et al 1977; Stevens 1988,1992b).

CASAtech is an attempt to co-operatively offer an extended curriculum to rural students using new distance education technologies. In this way it is expected that students in these schools will gain access to a larger curriculum than would otherwise be possible.

The project is at present only at an initial stage and it is too early for any meaningful evaluation to be completed. The following preliminary observations (Mander, 1993) have been made regarding what is required for the success of the project:

1. Access to reliable distance education technologies
2. Ready access to free or low cost technical assistance to set up the network
3. Ready access to low cost on-going professional assistance to maintain the network
4. Recognition of the problems involved in teaching and learning at a distance
5. On going professional development programmes
6. Student programmes to develop student learning skills
7. Good facilities
8. Co-ordination of school programmes
9. Active community support
10. Occasional special events to show the potential of the system
11. Meetings of those participating in the programme
12. Sponsorship will be required in the initial stages.

As rural and distance educators increasingly apply modern communication and information technologies to the delivery of education, their methods are likely to become increasingly mainstreamed in urban as well as rural schools (Stevens, 1992c). There are implications for school

organisation, professional development, teaching and learning and the delivery of the curriculum in the CASA tech project which should be nationally monitored. This project is opening new ways of delivering education through inter-institutional co-operation, a form of teaching and learning with little in the research literature at present to guide professional decision making. While this project is regional in scope in 1993, there is the potential, considering the technologies that are increasingly becoming available, and with the development of NZ On-Line's Learning Link network, of electronically linking rural schools nation-wide. Ultimately, this project provides a window into a future in which it is possible to envisage rural and urban New Zealand schools becoming internationally networked, given that a number of schools already use NZ On-Line's Internet connectivity.

Network Two: The North Island

Stratford High School was one of four New Zealand High schools (grades 8-12) that were awarded a special NZ$400,000 Ministry of Education grant in 1993 to develop innovative programmes in technology and provide leadership in the implementation of technology education. All of the 24 contributing schools that Stratford High School is linking via modem to its library software and CD-ROM facilities are primary schools (grades 1-7), some of which are very small in terms of enrolments. The other major link is from Stratford High School to Taranaki Polytechnic to provide an Internet Link.

As with the CASA tech project, it is too early to fully evaluate this development at the present time. However, a few preliminary observations can be reported from the participants at this stage.

1.There is a need for mutual timetabling and joint planning between all of the schools in the network is becoming apparent.

2. There is a need for technical support to install modems and establish the network links in many of the small schools that form the technology network.

3.There is a need for teacher as well as student networking. In many instances students are more computer literate than their teachers and have more extensive knowledge of the technology to be used. In some cases teachers in small and isolated primary schools were unsure how to use the technology once it had been connected to the network, for the enhancement of teaching and learning.

4. Through this project students in small rural Taranaki schools will be able to contact one another and work together to some extent, sharing the experience of learning. In small primary schools with only one or two teachers, this offers useful ways of organising young people to work with teachers and students in other schools, freeing teacher time for more intense face to face instruction with students who require extra attention.

5. There is a need for teacher education in methods of inter-school teaching and learning as well as in the administration of a network. Some teachers initially displayed reluctance in adopting information technology in their classrooms. Stratford High School bought laptop computers for its teachers from the technology grant and allowed them to explore the potential of information technology for their classes. Later the laptops were taken to other participating schools so that more teachers in the network could have the same experience.

6. There is a problem of which technology to select. Information and communication technology changes and becomes obsolete rapidly. For schools there is the temptation to use less expensive equipment and to purchase with quantity in mind. Under-powered computers have limited use in the development of networks.

7. A further potential problem lies in the incompatibility of computers in schools. Not all computers in the network are made by the same company. This has implications for the network if other than E-mail is contemplated. Without compatible technology, a school network is unlikely to be successful.

8. There is a problem, particularly in the smaller schools, of insufficient computers to go around to enable all students to share equally in the networking experience.

There are considerable advantages in the use of networks for one and two teacher schools in that students will have the opportunity to develop independent learning skills by getting into networks with other schools. However, the Taranaki experience has shown that teachers are sometimes reluctant to change their teaching styles to accommodate this sort of development and it is necessary to assign certain personnel to assist others if there is to be any chance of success.

While there are considerable implications for school organisation and the scope of the curriculum as technology is applied to the networking of schools, the Taranaki experience has shown, in its initial stages, the importance of liaison with all areas of the school community if this sort of project is to be successful. Fortunately, this appears to be happening in Taranaki. A particularly important

aspect of liaison in the setting up of a network is in the professional development of the teachers who are expected to incorporate inter-institutional teaching and learning in their conventional classrooms.

Main Findings: Educational and Policy Issues

Although these two networks are at an early stage of development a number of educational and policy issues are emerging which will guide future research.

Research is needed in the matter of rural schools' application of information and communication technologies in extending curriculum choice at senior high school level as well as in the assessment of learning outcomes in relation to urban schools. The outcome of such research is likely to influence the extent to which future governments support the up-grading of technology in rural schools.

As new technologies increasingly influence the organisation of education in rural schools, it is appropriate that the requirements of particular groups: girls, Maoris and Pacific Island students and children with special learning needs in particular, be assessed in relation to its introduction.

Longitudinal research is needed to determine whether rural students in future enter tertiary educational institutions and professional occupations in numbers that approximate those of their urban counterparts. The advent of school networks in New Zealand has the potential to influence the tertiary educational and vocational choices of rural students in future.

Little is known from rural parents' and students' perspectives how, in qualitative terms, information and communication technologies reduce educational isolation. This information would be of value to all professionals involved in the delivery of education in remote locations as well as to companies that sell technology. It is possible that increased use of technology may actually increase educational isolation for some rural students and their families if its application reduces teacher contact. Furthermore, the application of increasingly sophisticated information and communication technologies in schools in small rural communities may contribute to the isolation of students from their parents who are not introduced to either its use or made aware of its educational and vocational potential.

New technologies in rural schools are unlikely to be fully utilised unless attention is given to the professional development of teachers in their selection, application and then assessment in

relation to teaching and learning. (Stevens, 1991, 1992a). Research into the changing needs of the rural teaching profession, with particular attention to these matters, would be very timely. New technologies provide ways in which rural teachers can access professional development courses.

Changes in communication technologies in a deregulated national telecommunications system (Prebble, 1993) can be expected to influence the delivery of education within rural schools for the rest of this decade. Communication technologies can be assembled in a variety of ways to facilitate the delivery of education anywhere in New Zealand. This aspect of distance education was recognised by both of the major New Zealand political parties in the 1993 election (New Zealand Labour Party, 1993; New Zealand National Party, 1993). Rural educators now face the task of realising the educational potential of recent technological advances. This will require a re-assessment of the role of the teacher in rural schools and, indirectly, to the rural economy. Technology will never replace the teacher in any classroom, but with careful planning and judicious use, it can provide ways of enhancing rural education.

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